VISHNYAKOV, A.V.

Carding Machines

B.V. Vladimirov's article "Aerodynamics of the scutching chamber." A.V. Vishnyakov. Tekst. prom. 12, No. 6, 1952.

Monthly List of Russian Accessions, Library of Congress, October 1952, UNCLASSIFIED

VISHNYAKOV, A. V.

Vishnyakov, A. V. -- "The Effect of Blowing Off Carbon Monoxide on the Quality of Steel Melting in Electric Furnaces." Cand Tech Sci, Moscow Inst of Steel, Moscow 1953. (Referativnyy Zhurnal--Khimiya, No 1, Jan 54)

So; SUM 168, 22 July 1954

USSR/Engineering - Metallurgy FD-1383

Card 1/1 : Pub. 41-10/18

Author : Vishnyakov, A. V. and Samarin, A. M., Corresponding Member, Academy of Sciences, USSR

Title : The effect of blowing with carbon monoxide on the quality of steel made in electric furnaces

Periodical : Izv. AN SSSR. Otd. Tekh. nauk 3, 102-109, 1954

Abstract : Discusses possibility of purifying molten steel through removal of hydrogen and nitrogen by blowing with carbon monoxide, this accelerating steel melting because part of oxidation period may be replaced by blowing with carbon monoxide during reducing period. Also discusses purification of steel by removal of sulfur, oxygen, and nonmetallic inclusions. Tables, diagrams, micrographs

Institution :

Submitted : March 25, 1954

VISHNYAKOV, A. V.

YEDNERAL, F.P., dotsent, kandidat tekhnicheskikh nauk; VISHNYAKOV, A.V., kandidat tekhnicheskikh nauk.

Protection of immersion thermocouples during temprature measurements in electric furnaces. Sbor. Inst. stali no. 32:161-166 '54. (MLRA 10:5)

(Thermocouples)

VISHNYAKOV, A.V., kandidat tekhnicheskikh nauk.

Calculation of torque imparted by the centrifugal force of the windmill vane relative to the axis of motion. Sel'khozmashina no.12:17-21 D '55. (MLRA 9:3)

(Windmills)

VISHNYAKOV, A.V., kandidat tekhnicheskikh nauk.

Approximation method in calculating the aerodynamic moment of windmill wings in relation to the axis of rotation. Sel'khoz-mashina no.2:16-20 F '56. (MLRA 9:5)
(Windmills)

VLSHNYAKOV, A.V., dotsent.

Calculating intersecting forces and bending moments from the aerodynamic forces of a windmill vane. Sel'khozmashina no.4:23-26 Ap '57. (MLRA 10:4)

(Windmills)

L 26491-66 EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6013070 SOURCE CODE: UR/0048/66/030/004/0637/0643

AUTHOR: Bundel',A.A.; Vishnyakov,A.V.; Galaktionov,S.S.; Guretskaya,E.I.; Zhukov,G.V.; Kamenskaya,S.A.; Kreytser,K.A.; Oranovskaya,T.V.; Cheshchin,V.A.

ORG: None

TITLE: On the effect of the preparation conditions on the formation of traps in ZnS and ZnO base phosphors and the influence of predecomposition phenomena in solid solutions of Cu_2O in ZnS on their luminescence /Report, Fourteenth Conference on Luminescence held in Riga, 16-23 September 1965/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 4, 1966, 637-643

TOPIC TAGS: luminescence, crystal phosphor, zinc sulfide, current carrier, luminophor

ABSTRACT: Introduction of new experimental methods has increased rather than reduced the disagreement among different investigators regarding the structure of zinc sulfide luminophors. On the basis of previous investigations of glow curves and the polarity of the photocurrent carriers the authors showed that for the most part the discrepancies are due to inadequate control of the synthesis conditions, i.e., that the phosphors studied by different groups differed as regards structure owing to unintentional variations of the preparation conditions. Experiments show, for example, that truly self-activated ZnS exhibits only one glow curve peak, but that if the compound

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ACC NR: AP6013070

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is exposed to oxygen, even at low pressure, during heating a second glow-curve peak appears and this is accompanied by change in the polarity of the photocurrent carriers (from n to p). Various experiments were carried out with pure, self-activated and impurity-activated ZnS and ZnO (including surface oxidized specimens) and several series of glow curves are reproduced. Data on the polarity of the current carriers in photoconductivity are also adduced. The curves and data demonstrate the effects of the synthesis conditions. A series of phosphors was prepared by heating different mixtures of ZnS with Cu_2S without flux at 1000°C, followed by reheating with quartz powder (to prevent caking) in sealed tubes at 1050°. These ZnS:Cu phosphors were studied immediately after preparation, after various heat treatments and after storage for some months at 20°. Their attributes differed considerably, again indicating the importance of synthesis and other conditions. It is pointed out that understanding of the peculiarities of the complicated chemical system constituted by copper-activated zinc sulfide luminophors requires further thorough investigation of the $ZnS-Cu_2S-Cu$ system. Orig. art. has: 1 formula and 6 figures.

SUB CODE: 20/ SUBM DATE: 00/ ORIG REF: 008/ OTH REF: 008

Card 2/2 UC

VISHNYAKOV, A.V., kand. tekhn. nauk; DANILOV, P.I., kand. tekhn. nauk; METALEVA, G.G., inzh.; PASHCHENKO, V.Ye., inzh.; KUZ'MENKO, V.S., inzh.; BELYAKOV, A.I., inzh.; SIVAKOVA, V.S., inzh.

Properties of transformer steel made of ingots with closed pipe. Stal' 24 no.9:812-814 S '64. (MIRA 17:10)

1. Sibirskiy metallurgicheskiy institut, Kuznetskiy metallurgicheskiy kombinat i Novosibirskiy metallurgicheskiy zavod.

VISHNYAKOV, A.V.

Design and calculation of the fluff catcher system with individual nozzles for spinning machines. Izv. vys. ucheb. zav.; tekh. tekst. prom. no.6:145-151 '63 (MIRA 17:8)

1. Moskvoskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti.

VISHNYAKOV, A.V.

Pouring killed steel into ingot molds without riser heads. Stal' 23 no.12:1068 D '63. (MIRA 17:2)

1. Sibirskiy metallurgicheskiy institut.

VISHNYAKOV, A.V.

Regulation of the pressure in the nozzles of spinning machine separators by the length of the central air duct. Izv.vys. ucheb.zav.; tekh.tekst.prom. no.2:130-138 '63. (MIRA 16:6)

1. Moskovskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti.

(Spinning machinery)

VISHNYAKOV, A.V.; DANILOV, P.M.; METELEVA, G.G.; BORODULIN, A.I.; TKACHEV, I.S.; PLEKHANOV, P.S.

Fusion of closed shrinkage cavities in killed steel ingots. Izv. vys. ucheb. zav.; chern. met. 5 no.8:44-52 '62. (MIRA 15:9)

1. Sibirskiy metallurgicheskiy institut i Kuznetskiy metallurgicheskiy kombinat.

(Steel ingots—Defects)

39748
S/148/62/000/006/001/005
E071/E435

11500

AUTHORS: Vishnyakov, A.V., Danilov, P.M., Meteleva, G.G., Borodulin, A.I., Tkachev, I.S., Plekhanov, P.S.

TITLE: Casting of 7 ton ingots of killed steels with closed shrinkage cavity

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no.6, 1962, 32-38

TEXT: The possibility of teeming 7 ton ingots with a closed shrinkage cavity which is sufficiently clean as regards non-metallic inclusions and segregations to become welded together on rolling was demonstrated. For insulating the closed shrinkage cavity from air, a skin of 3 to 5 mm thick would be sufficient but for the fact that on reheating the ingot such thin skin can melt and, therefore, the thickness of an insulating layer of 20 to 100 mm is desirable. The principle of the method is to form a bridge in the shrinkage cavity soon after teeming. This bridge will divide the shrinkage cavity into closed and open parts. The closed part will

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weld together during rolling so that only the open part of the cavity has to be cut off. Altogether five modifications of teeming practice were tested (described in some detail and illustrated). Depending on the teeming practice, the size of the cut off end varied from 3 to 7%. Subsequent testing of the vertical cross-section of an ingot with closed shrinkage cavity for the segregation of carbon, phosphorus and sulphur showed that the degree of segregation was small and did not exceed the degree of segregation encountered in normal ingots. There are 4 figures.

ASSOCIATION: Sibirskiy metallurgicheskiy institut i Kuznetskiy metallurgicheskiy kombinat (Siberian Metallurgical Institute and Kuznetsk Metallurgical Combine)

SUBMITTED: May 20, 1961

VISHNYAKOV, A.V.

Engineering method for calculating loads on the mechanism of changes in propeller pitch caused by blades of arbitrary stagger. Izv.vys.ucheb.zav.; av.tekh. 3 no.1:12-27 '60. (MIRA 13:5)

1. Moskovskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti. Kafedra vysshey matematiki i teoreticheskoy mekhaniki.
(Propellers, Aerial)

VISHNYAKOV, A.V., kand.tekhn.nauk dots.

Casting ingots with closed shrinkage cavitites. Izv.vys.ucheb. zav.; chern.met. 2 no.9:47-52 S 59. (MIRA 13:4)

1. Sibirskiy metallurgicheskiy institut. Rekomendovano kafedroy elektro-metallurgii Sibirskogo metallurgicheskogo instituta.
(Steel ingots)

1.9000

69313

S/147/60/000/01/002/018
E191/E581

AUTHOR: Vishnyakov, A.V.

TITLE: An Engineering Method of Analysis of the Load on the Pitch Changing Mechanism of a Propeller Due to a Blade of Arbitrary Span

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Aviatsionnaya tekhnika, 1960, Nr 1, pp 12-27 (USSR)

ABSTRACT: An engineering method of computing the blade pitching moments about the torsion axis due to aerodynamic and centrifugal forces is presented, distinguished by the explicit form of relating this moment to the geometry and the dynamic parameters of the propeller and its blades. The main purpose of the method is the rapid and physically clear introduction of modified parameters during development work. Instead of using the aerodynamic curves of aerofoils as in other methods, a family of curves of geometrically similar propellers is used as a basis, being more representative than two-dimensional aerofoil characteristics. The contribution of the

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S/147/60/000/01/002/018
E191/E581

An Engineering Method of Analysis of the Load on the Pitch Changing Mechanism of a Propeller Due to a Blade of Arbitrary Span

profile drag forces to the pitching moment is neglected. In the contribution of the lift forces, integrals are separated which depend purely on the geometry. The aerodynamic moment coefficient is assumed proportional to the relative thickness of the profile at both subsonic and supersonic velocities. The lift coefficient is assumed proportional to the incidence. The elastic twist of the blade in operation is neglected as insignificant. The pitching moment due to the lift forces is expressed in terms of the blade geometry in which only the pitch angle of a representative section and the total built-in twist are considered. The planform is determined by the course of the sweepback angle between the direction of flight and the line joining the centre of gravity of the section to the blade torsion axis in a plane perpendicular to the plane of rotation. The cases of a constant sweepback angle and variable

Card 2/3 angle (corresponding to a special light aeroplane

An Engineering Method of Analysis of the Load on the Pitch Changing Mechanism of a Propeller Due to a Blade of Arbitrary Span

propeller and a swept back heavy load carrying aeroplane, respectively) are considered separately alongside the usual case of zero sweepback. The aerodynamic moment due to the displacement of the aerodynamic centre is also expressed in terms of blade geometry. A coefficient which represents the details of blade geometry is almost independent of the conditions of operation. The pitching moment due to centrifugal forces is composed of two parts. The first part, independent of the sweepback angle, is expressed in terms of the polar mass moment of inertia of the blade and a certain mean pitch angle. The second part, which depends on the sweepback, is computed separately for a constant and a variable sweepback angle. There are 4 figures.

ASSOCIATION: Kafedra vysshey matematiki i teoreticheskoy mekhaniki, Moskovskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti (Chair of Higher Mathematics and Theoretical Mechanics, Moscow Production Methods Institute of the Milk and Meat Industries)

SUBMITTED: October 1, 1959

18.3200

77134
SOV/148-59-9-4/22

AUTHOR: Vishnyakov, A. V. (Candidate of Technical Sciences, Docent)

TITLE: Casting of Ingots With Closed Shrinkage Cavity

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, 1959, Nr 9, pp 47-52 (USSR)

ABSTRACT: An experimental casting of ingots with closed shrinkage cavity for the purpose of increasing the output of sound steel by welding the cavity during hot working of metal by forces of pressure. The welding of cavity is a process of drawing together its surfaces to the distance of atomic interaction. Such drawing together may be interfered with by the scale, gas, nonmetallic inclusions, temperature, and the degree and the type of deformation. The author tested 4 methods of casting the ingots with closed cavity, and evaluated their reliability in sealing the cavity. They were as follows: (1) pouring into molds without hot topping and without covering the surface of metal

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by a heat insulating material; (2) pouring into molds without hot topping but with spraying of the surface of liquid metal by water; (3) pouring into molds without hot topping but with laying on the surface the floating metal lids; (4) pouring into molds without hot topping but with immersion of metal plates into the liquid metal. The author gives an analysis of all of the above methods. He states that the first and the second methods do not insure a reliable sealing of the cavity from the atmosphere. He gives the calculated speeds of cavity formation in the instantly poured ingots of 0.7, 2.8, and 7-ton weight. The dimension of ingots (average cross section in mm) were: 320 x 320; 510 x 510 and 700 x 700; H/D - 3 in all cases. The thickness of solidified metal was calculated. The coefficient of crystallization was taken as 2.6 cm $min^{1/2}$, and shrinkage as 3.5% (Fig. 1). The author reviews the ingot pouring practice of 50 years ago, when water spraying of metal was popular. He offers a suggestion (Fig. 2) that in those days the thickening of the ingot crust (or closing of flaws) could occur during the stripping and transportation of the ingot (at the expense of

Casting of Ingots With Closed Shrinkage Cavity

77134, SOV/148-59-9-4/22

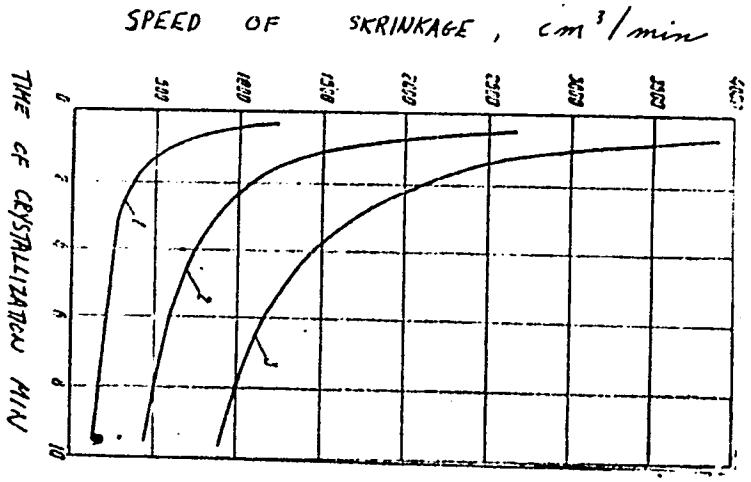

Fig. 1. The change of speed of shrinkage cavity formation depending on time and the ingot weight: (1) ingot 0.7 ton; (2) ingot 2.8 ton; (3) ingot 7.0 ton.

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Casting of Ingots With Closed Shrinkage Cavity

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SOV/148-59-9-4/22

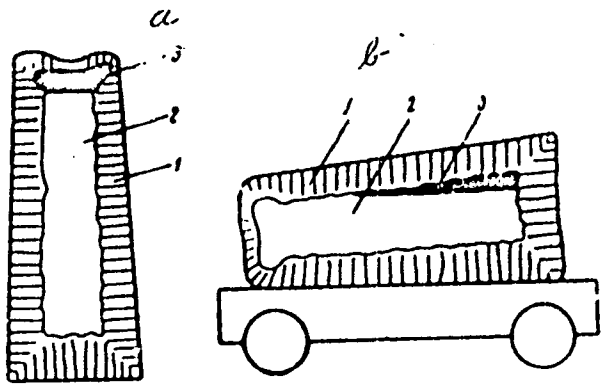

Fig. 2. A schematic diagram of thickening of the crust of solid metal over the shrinkage cavity at the expense of the liquid core of the ingot: (a) ingot's position during pouring; (b) ingot's position during transportation from the pouring platforms to the soaking pits of the rolling mill; (1) solid metal; (2) liquid metal; (3) shrinkage zone.

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liquid metal in the core). The third method is based on the principle of external cooling of metal (Fig. 6).

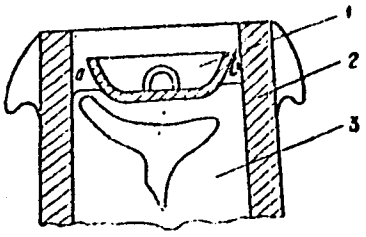

Fig. 6. A schematic diagram of pouring ingots by the third method: (1) metal lid; (2) mold; (3) ingot.

The pouring of ingots (method 4) with immersion of metal plates into liquid metal plates into liquid metal, in most cases assures a good sealing of the cavity but there is always a possibility of flaw

formation on the periphery of the plate. Therefore, all the methods of ingot pouring with closed shrinkage cavity based on the formation of the crust (over the cavity), which is not thickened later on, are not reliable. For improved welding, the ingot's cavity should be as narrow as possible and not concentrated. The author favors the idea of casting the ingots with two shrinkage cavities, open and closed. The upper portion of the cavity is open and subject to oxidation and, during hot working by the forces of pressure, does not weld. The rolled part of this portion of ingot goes into scrap. The lower part of the cavity in the ingot is well isolated from the atmosphere and welds well. The outpout of sound metal with this method is considerably higher than with the others. It is recommended to continue the investigation of a possibility of instillation of this method in the industrial practice. There are 8 figures; and 5 Soviet references.

ASSOCIATION: Siberian Metallurgical Institute (Sibirskiy metallurgicheskiy institut)

SUBMITTED: January 19, 1959

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860110004-0"

VISHNYAKOV, A.V., kand.tekhn.nauk, dotsent; VOINOV, S.G., kand.tekhn.nauk; DANILOV, P.M., inzh.

Changes in impurity inclusion in metals between furnace and mold. Izv.vys.ucheb.zav.; chern.met. no.6:47-53 Je '58. (MIRA 12:8)

1. Sibirskiy metallurgicheskiy institut, TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii i Kuznetskiy metallurgicheskiy kombinat. Rekomendovano kafedroy elektrometallurgii stali i ferrosplavov Sibirskogo metallurgicheskogo instituta.

(Steel--Defects)

VISHNYAKOV, A.V., kand. tekhn. nauk, dots.

Increasing the output of usable steel from ingots. Izv. vys. ucheb. zav.; chern. met. no.4:55-59 Ap '58. (MIRA 11:6)

1. Sibirskiy metallurgicheskiy institut.
(Steel ingots)

VISHNIAKOV, A.V.

Raschet na prochnost', na vibratsiiu i opredelenie krutiashchego momenta ot tsentrobezhnykh sil serii metallicheskikh vintov. (Tekhnika vozdushnogo flota, 1937, v.11, no.4, p.27-47, diagrs.)

Title tr.: Stress analysis, vibration characteristics and the couple required to vary the pitch of a family of metal propellers.

TL504.T4 1937

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress, 1955.

L 18763-66 EWT(m)/EWP(t) IJP(c) JD
ACC NR: AP6003771 SOURCE CODE: UR/0181/66/008/001/0115/0119

AUTHORS: Bundel', A. A.; Vishnyakov, A. V.

ORG: Moscow Chemical Technology Institute im. D. I. Mendeleyev (Moskovskiy khimiko-tekhnologicheskiy institut)

TITLE: Supersaturated solid solutions of Cu_2S in ZnS and their luminescence properties 48 B

SOURCE: Fizika tverdogo tela, v. 8, no. 1, 1966, 115-119

TOPIC TAGS: solid solution, copper compound, zinc compound, optic material, luminescence, luminor, optic activity, luminescence center

ABSTRACT: This is a continuation of earlier work (Abstract, Doctoral Dissertation, Moscow State Univ., 1956) dealing with the luminescence properties of zinc-sulfide luminors activated with copper, and is devoted to a study of the influence of low-temperature annealing on the luminescence spectra of rapidly quenched luminors as a function of the activator concentration ZnS.Cu luminors with concentrations 2

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L 18763-66
ACC NR: AP6003771

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5×10^{-4}, 1×10^{-3}, 2×10^{-3}, and 4×10^{-3} g Cu/g ZnS were tested. The preparation and quenching of the material are described. The luminescence was excited with a 365 nm line and measured with a monochromator (UM-2), a photomultiplier (FE-51) and a galvanometer. With increasing quenching time, the luminescence color changed successively from green to yellow to red to blue. The maximum of the luminescence spectrum also shifted towards longer wavelengths with increasing activator concentration. The results are interpreted as being due to a close interconnection between the luminescence centers, especially those responsible for the yellow and red luminescence, with the segregation of copper and formation of Guinier-Preston bands, and with other processes preceding and accompanying the decay of the solid solution. Orig. art. has: 4 figures.

SUB CODE: 20/ SUBM DATE: 03Jul65/ ORIG REF: 003/ OTH REF: 009

Card 2/2 *[illegible]*

VISHNYAKOV, A.Z.

Punching die with an automatic floating cutting blade. Trakt.i sel'khozmash. 30 no.2:45-46 F '60. (MIRA 13:5)

1. Rostsel'mash.
(Punching machinery)

VISHNYAKOV, A.Z.

Consecutive action stamping die for the manufacture of parts with curling. Kuz.-shtam. proizv. 1 no.8:45-46 Ag '59. (MIRA 12:12)

(Metalworking machinery)

VISHNYAKOV, A.Z., inzh.

Selecting optimum gaps for punching machinery parts from heated metal. Trakt. i sel'khozmash. 30 no.7:43-44 Jl '60. (MIRA 13:10)
(Metalwork)

ACC NR: AP7002406 SOURCE CODE: UR/0363/66/002/012/2234/2236

AUTHOR: Vishnyakov, B. A.; Osipov, K. A.; Otopkov, P. P.

ORG: Institute of Metallurgy im. A. A. Baykov, Academy of Sciences, SSSR (Institut metallurgii Akademii nauk SSSR)

TITLE: Study of the deposition of tin and silicon films from their organic compounds under the influence of an electron beam

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 12, 1966, 2234-2236

TOPIC TAGS: tin, silicon, metal deposition, electron beam, silane, organotin compound

ABSTRACT: A recently developed method of depositing thin films by decomposing organic compounds subjected to electron bombardment was tested on tetraethyltin and tetrapropyltin (for depositing tin) and triethylvinylsilane (for depositing silicon), and the factors affecting the growth rate of the silicon film were studied. The decomposition of triethylvinylsilane molecules was studied in particular detail. It was found that the growth rate of the silicon film during 5 hr changed linearly with time. At substrate temperatures of 135-200°C, the growth rate also varied linearly with changing current density of the electron beam. The growth rate decreased with rising substrate temperature and was independent of the electron energy. A linear relationship was ob-

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ACC NR: AP7002406

served between the vapor pressure in the chamber and the growth rate of the film. The electric resistance of silicon films obtained under various conditions was measured. Orig. art. has: 2 figures, 1 table and 4 formulas.

SUB CODE: 07,11/ SUBM DATE: 16Nov65/ OTH REF: 005

Card 2/2

S/275/63/000/001/002/035
D469/D308

AUTHOR: Vishnyakov, B. A. and Popov, A. T.

TITLE: Electron gun with tantalum cathode

PERIODICAL: Referativnyy zhurnal, Elektronika i yeye primeneniye, no. 1, 1963, 8-9, abstract 1A 32 (In collection: "Elektron. uskoriteli", Tomsk, Tomskyy un-t, 1961, 203-207)

TEXT: Electron guns (G) in experimental assemblies necessitate the use of cathodes (C) with good emission ability, whose longevity does not depend on the operational vacuum of the system. The C should allow for a large number of disturbances in the hermetic closure of assembly. In consequence, oxide C are not as good for these purposes as are metal, particularly tantalum, C. Foils of tantalum are easily worked and hence C of any configuration can be made. The emissivity of tantalum at 2400°C is $>2A/cm^2$ and vapor pressure does not exceed 10^{-6} mm Hg. The C is best heated by bombarding it with an electron beam from an auxiliary heater G, for

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Electron gun with ...

instance from a radially disposed tungsten spiral around the C (made from a wire of 0.1 mm diameter). It should be noted that when C is heated by bombardment with an electron beam, the inter-electrode capacity decreases considerably and this is important when operating with short pulses. Schematic drawings are given of two electron G whose parameters are alike: the shapes of G and electrodes have been calculated, but the final shape of G electrodes has been chosen experimentally. Photographs of both G are shown. The general G with tantalum C operates at the voltage of 70 kV, with current impulses of 1 A (2 μsec long). The heater G has the working voltage of 4.5 kV and constant current of 0.1 A. The method of fixing the tantalum disc to the electrode is interesting; this is done through an intermediate ring while stretchers made of tantalum strips 0.1 mm thick, are point-soldered to the ring and the disc. This ensures small heat escape to external fixtures. The C are best prepared of strips of tantalum 1 mm thick. This secures uniform heating of C and large thermal inertia of the system, which in turn enables us to obtain high emission stability of a general electron G, without the need for special stabilization of incandes-

8/275/63/000/001/002/035
D469/D308

Electron gun with ...

cence and of heating with auxiliary G. The G electrodes were prepared of steel, nickel and copper. The anode is of copper in order to improve heat dissipation. The edges of electrodes are rounded and polished. Internal elements of G can operate without necessarily cooling them. Heat is conducted to the body which is water- or air-cooled. The principal circuit of G is shown. The heater circuit contains a rectifier to suppress undesirable electron emission from the back of tantalum C. 2 references. [Abstracter's note: Complete translation.]

Card 3/3

ACC NR: AP7005892 SOURCE CODE: UR/0181/66/008/012/3706/3708

AUTHOR: Vishnyakov, B. A.; Osipov, K. A.

ORG: Institute of metallurgy im. A. A. Baykova AN SSSR (Institut metallurgii AN SSSR)

TITLE: Deposition of molybdenum carbide films from molybdenum hexacarbonyl under the action of the electron beam

SOURCE: Fizika tverdogo tela, v. 8, no. 12, 1966, 3706-3708

TOPIC TAGS: thin film, molybdenum, carbide, ~~film, film~~ deposition, metal ~~vacuum~~ vapor deposition, ~~film growth rate, film~~ electric resistance, vanadium ~~carbide~~

ABSTRACT: Molybdenum-carbide films, 1100—8800 Å thick, were made by vapor deposition of molybdenum hexacarbonyl molecules ($Mo(CO)_6$) on a quartz or a mica-coated glass substrate at -30, -25, -15, -5, +5 and +10°C, in a vacuum of $2 \cdot 10^{-6}$ mm Hg. A stream of $Mo(CO)_6$ molecules was directed onto the substrate simultaneously with the electron beam at a current density of 0.3—1.5 μamp/cm^2 and an accelerating voltage of 250—600 v. The film

Card 1/2 UDC: none

ACC NR: AP7005892

growth rate was found to increase linearly with time and current density. The experimental data on the film growth rate agreed satisfactorily with the theoretical. The electric resistivity of the obtained MoC films varied from 180 to 29,300 ohm/cm^2. Orig. art. has: 1 figure and 1 table. [MS]

SUB CODE: 20,11/ SUBM DATE: 15Jul66/ ATD PRESS: 5117

Card 2/2

CHELNOKOV, I.I., doktor tekhn. nauk, prof.; VISHNYAKOV, B.I., inzh.; GARBUZOV, V.M., inzh.; ESTLING, A.A., kand. tekhn.nauk; DOLMATOV, A.A., kand. tekhn. nauk, retsenzent; SARANTSEV, Yu.S., inzh., red.; USENKO, L.A., tekhn. red.

[Vibration dampers for railroad cars] Gasiteli kolebanii vagonov. [By] I.I.Chelnokov i dr. Moskva, Transzheldorizdat, 1963. 175 p. (MIRA 16:5)
(Railroads--Cars--Vibration) (Damping (Mechanics))

VISHNYAKOV, B.I., inzh.; ESTLING, A.A., inzh.

Methods of testing vibration dampers for passenger cars. Sbor. trud.LIIZHT no.183:69-94 '62. (MIRA 16:2)
(Damping (Mechanics)) (Railroads—Passenger cars—Vibration)

MOSKALENKO, Ye.I., kand. tekhn. nauk, dotsent; VISHNYAKOV, B.I., kand. tekhn. nauk; SHASHKOV, N.A., inzh.

Experience in the operation of hydraulic vibration dampers of the central stage of passenger car suspension. Sbor. trud. LIIZHT no.215:142-159 '64. (MIRA 17:12)

VISHNYAKOV, B.I., inzh.

Effect of the wear of the parts of the wheel turning lathe on wheel eccentricity. Sbor.trud. LIIZHT no.197:71-86 '62.
(MIRA 16:8)

(Car wheels—Testing)

VISHNYAKOV, B.I.

Supplements to the standard for wheel pairs of railroad cars. Standartizatsiia 24 no.6:28-30 Je '60. (MIRA 13:7)

(Car wheels--Standards)

BEZTSENNYY, Viktor Ivanovich, inzh.; PETROV, Vasiliy Afanas'yevich, kand. tekhn. nauk; SAKHAROV, Mikhail Borisovich, inzh.; TUROVTSEV, Vasiliy Ivanovich, kand. tekhn. nauk. Prinimal uchastiye CHERNYSHEV, P.N., inzh.; KHUDOKORMOV, V.I., inzh., retsenzent; EVIN, G.D., inzh., retsenzent; DERGACH, Ye.S., inzh., retsenzent; GROKHOL'SKIY, N.F., kand. tekhn. nauk, retsenzent; NIKOLAYEV, K.I., kand. tekhn. nauk, retsenzent; SMARAGDOV, G.I., kand. tekhn. nauk, retsenzent; ZOLOTNIKOV, I.M., kand. tekhn. nauk, retsenzent; VISHNYAKOV, B.I., aspirant, retsenzent; ARSHINOV, I.M., inzh., red.; MEDVEDEVA, M.A., tekhn. red.

[Car repairing at factories] Remont vagonov na zavodakh. By V.I.Beztsennyi i dr. Moskva, Vses.izdatel'sko-poligr. ob"edinenie M-va putei soobshcheniia, 1961. 363 p. (MIRA 14:12)

1. Kafedra "Vagony i vagonnoye khozyaystvo" Leningradskogo instituta inzhenerov zheleznodorozhnogo transporta (for Grokhol'skiy, Nikolayev, Smaragdov, Zolotnikov)
(Railroads--Cars--Maintenance and repair)

VISHNYAKOV, B.I., inzh. (Leningrad)

Using vinyl plastics in railroad transportation. Zhel. dor. transp. 41 no.5:64-66 My '59. (MIRA 12:7)
(Vinyl compounds)
(Railroads--Equipment and supplies)

VISHNYAKOV, B.I., inzh.

Effect of the rigidity of the wheel lathe on the machining precision of the roller face of wheel flanges. Stor. LIIZHT no.168:221-230 '60. (MIRA 13:10)

(Car wheels)

CHELNOKOV, I.I., dr. tekhn. nauk, prof.; VISHNYAKOV, B.I., kand. tekhn. nauk; VARAVA, V.I., kand. tekhn. nauk; GORBUZOV, V.M., inzh.; SAPRYKIN, L.I., inzh.

Test bench for the vibration dampers of railroad vehicles. Sbor. trud. LIIZHT no.215:160-170 '64. (MIRA 17.12)

S/030/63/000/001/008/013
B117/B186

AUTHOR: Vishnyakov, B. S.

TITLE: Discussion of scientific problems of modern technology (Joint session of the otdeleniy tekhnicheskikh nauk Akademii nauk SSSR (Departments of Technical Sciences of the Academy of Sciences USSR) i Akademii nauk Ukrainskoy SSR (and of the Academy of Sciences Ukrainskaya SSR))

PERIODICAL: Akademiya nauk SSSR. Vestnik, no. 1, 1963, 114 - 117

TEXT: The joint session held in Kiyev from October 29 to November 1, 1962 by the Departments of Technical Sciences of the All-Union and the Ukrainian Academies of Sciences was attended by more than 800 scientists of various special fields. The work was divided into plenary meetings and four sections (power engineering; mechanics and automation; mining; metallurgy). Surveys of actual problems were given at the plenary meetings. Academician B. Ye. Paton, President of the Academy of Sciences UkrSSR, opened the session and stressed the importance of science to Communism and the necessity for closer contacts between theory and practice. Academician A. A. Blagonravov analysed the present state of the principal technical fields paying special

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attention to theoretical problems. G. V. Samsonov, Corresponding Member AS UkrSSR, reported on the cooperation of the individual institutes of the AS UkrSSR between one another, and with the industry and schools of higher education. Academician B. Ye. Paton dealt with problems of electric welding and reported on work done in this field at the Institut elektrosvarki im. Ye. O. Patona (Electric Welding Institute imeni Ye. O. Paton) concerning the development of means to mechanize and automate welding processes, development of new welding methods and the corresponding apparatus. Academician M. V. Mel'nikov dealt with scientific and technical problems to improve open-pit mining on the basis of complex mechanization and automation, and stressed the economic importance of this working method. I. N. Frantsevich, Academician AS UkrSSR, reported on work done by the Institut metallokeramiki i spetsial'nykh splavov (Institute of Powder Metallurgy and Special Alloys) to develop refractory alloys (binary, ternary, and quaternary systems) with melting points above 1700 - 2000°C. L. R. Neyman, Corresponding Member AS USSR, dealt with problems of electrical engineering and recommended that new branches should be set up in schools of higher education to train specialists. A. A. Il'yushin, Corresponding Member AS USSR, reviewed the main trends in the research of strength and plasticity of materials. A. D. Kovalenko, Academician AS UkrSSR, reported on work done

Discussion of scientific problems...

in the technical theory of plasticity. Section "power engineering": V. S. Kulebakin, Academician, and V. A. Venikov, Doctor of Technical Sciences, delivered an eagerly discussed report on how increased frequency effects the basic parameters of electric systems. Professor I. M. Postnikov reported theoretical and experimental work on the direct transformation of heat into electricity by magnetohydrodynamic generators. M. V. Kostenko, Corresponding Member AS USSR, spoke about long-distance lines for extra-high a-c voltages. D. A. Zavalishin, Corresponding Member AS USSR, spoke about exciting systems for large synchronous machines. I. L. Povkh, Corresponding Member AS UkrSSR, spoke about the application of electromagnetic hydrodynamics to technology. O. A. Kremnev, Doctor of Technical Sciences, spoke about the possibility of using geothermic heat. Section "mechanics and automation": A. A. Il'yushin, Corresponding Member AS USSR, spoke about the inelastic stability of thin-walled constructions. S. V. Serensen, Academician AS UkrSSR, dealt with problems of estimating reserves of strength. A. I. Lur'ye, Corresponding Member AS USSR, dealt with problems of optimization in mechanics. A. G. Ivakhnenko, Corresponding Member AS UkrSSR, spoke about control principles of complex self-instructing systems. M. A. Ayzerman, Doctor of Technical Sciences, spoke about the technology of automatic pneumatic printers and new possibilities of pneumatic automation. Section

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"mining": M. I. Agoshkov, Corresponding Member AS USSR, reported on investigation results obtained during underground workings in the Krivoy Rog Basin. G. I. Man'kovskiy, Corresponding Member AS USSR, reported on methods of solving problems of rock freezing, particularly on the complex method of calculating frost walls developed at the Institut gornogo dela im. A. A. Skochinskogo (Mining Institute imeni A. A. Skochinskiy). I. N. Plaksin, Corresponding Member AS USSR, spoke about problems of dressing mineral resources, particularly iron ore and coal; and about the complex use of ores from the Ukrainian SSR. K. I. Tatomir, Corresponding Member AS UkrSSR, spoke about scientific fundamentals of working at great depths. N. S. Polyakov, Corresponding Member AS UkrSSR, spoke about results of investigation in the technology of ore mining. K. S. Borisenko, Corresponding Member AS UkrSSR, spoke about the increasing efficiency of pneumatic power in mining. Section "metallurgy": I. M. Fedorchenko, Academician AS UkrSSR, dealt with possibilities and problems of powder metallurgy in developing new materials. A. I. Tselikov, Corresponding Member AS USSR, spoke about scientific research problems in developing new metallurgical equipment. Z. I. Nekrasov, Academician AS UkrSSR, spoke about theoretical fundamentals and practical results in the operation of blast furnaces with combined blowing systems. D. M. Chizhikov, Corresponding

Discussion of scientific problems...

S/030/63/000/001/008/013
B117/B186

Member AS USSR, reported on new methods of producing and processing heavy nonferrous metals. K. K. Khrenov, Corresponding Member AS USSR, spoke about problems of cold welding of metals. The subjects mentioned in this article form only part of the reports delivered at the session. The final plenary meeting established the basic trends of scientific research, listed the main problems connected with production and technical progress, and suggested measures for training specialists.

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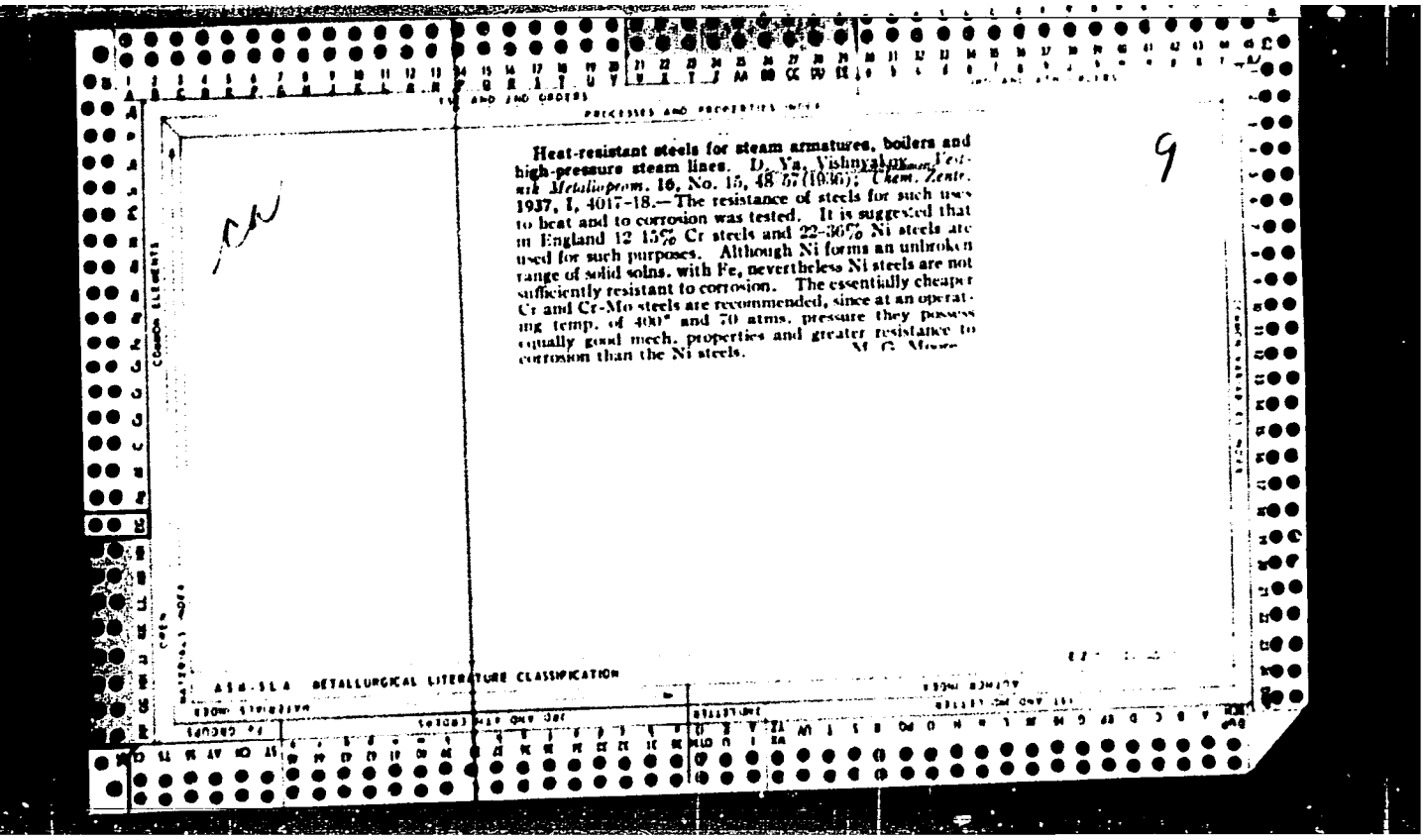
FOMIN, A.A.; VISHNYAKOV, B.S.; PROKHOROV, V.P.; KHAYEV, V.M.; SHVEDSKIY, A.I.; ORLIN, A.S., doktor tekhn. nauk, prof., retsenzent; VASIL'YEVA, N.G., inzh., red.

[Modern tractor diesel engines; atlas of designs] Sovremennye traktornye dizeli; atlas konstruktsii. Moskva, Mashgiz, 1963. 232 p. (MIRA 16:12)
(Tractors—Engines)



Heat-resistant steels for steam armatures, boilers and high-pressure steam lines. D. Ya. Vishnyakov, *Vestnik Metallioprom.* **16**, No. 15, 48–57 (1936); *Chem. Zentr.* 1937, I, 4017–18.—The resistance of steels for such uses to heat and to corrosion was tested. It is suggested that in England 12–15% Cr steels and 22–36% Ni steels are used for such purposes. Although Ni forms an unbroken range of solid solns. with Fe, nevertheless Ni steels are not sufficiently resistant to corrosion. The essentially cheaper Cr and Cr-Mo steels are recommended, since at an operating temp. of 400° and 70 atms. pressure they possess equally good mech. properties and greater resistance to corrosion than the Ni steels. M. G. Moore

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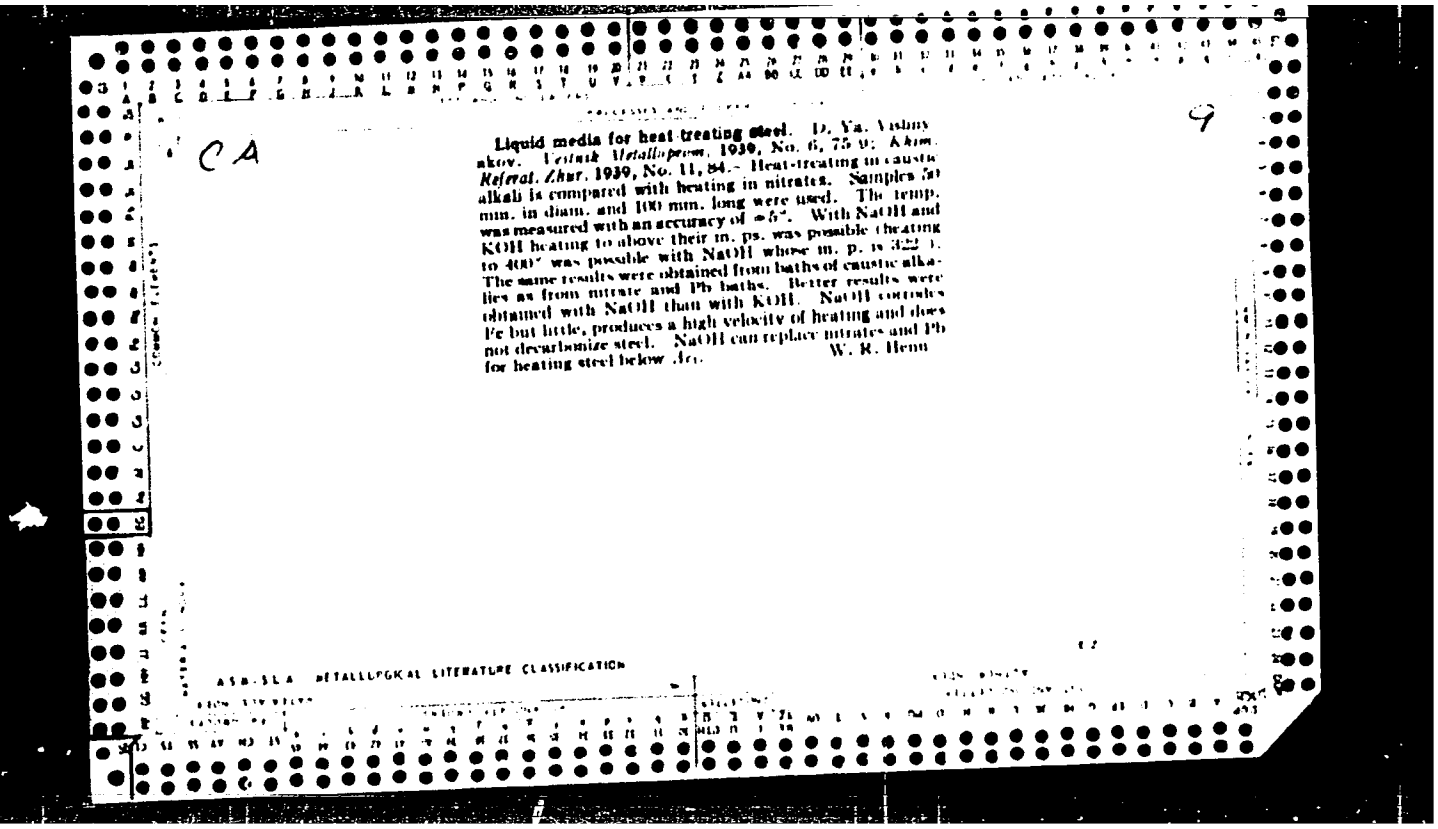
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



CA

Liquid media for heat treating steel. D. Ya. Vishnyakov. *Vestnik Metallopromy.* 1939, No. 6, 75-9; *Khim. Referat. Zhur.* 1939, No. 11, 84.— Heat-treating in caustic alkali is compared with heating in nitrates. Samples 50 mm. in diam. and 100 mm. long were used. The temp. was measured with an accuracy of ±5°. With NaOH and KOH heating to above their m. ps. was possible (heating to 400° was possible with NaOH whose m. p. is 322°). The same results were obtained from baths of caustic alkalies as from nitrate and Pb baths. Better results were obtained with NaOH than with KOH. NaOH corrodes Fe but little, produces a high velocity of heating and does not decarbonize steel. NaOH can replace nitrates and Pb for heating steel below Ac$_1$.

W. R. Henn

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

VISHNYAKOV, D. YA.

CA: 37-6536/6

VISHNYAKOV, D. YA.
Trudy Vsesoyuz. Pron. Akad. im. Stalina 1940, No. 2;
Khim. Referat. Zhur. 4, No. 7-8, 29 (1941)
The heat capacity of melts.

VISHNYAKOV, D. Ya. Dr. Tech. Sci.

Dissertation: "Properties of Molten Salts Used in Tank Furnaces." Moscow Order of the Labor Red Banner Inst. of Steel, imeni I. V. Stalin, 23 Jan 47.

SO: Vechernyaya Moskva, Jan, 1947 (Project #17836)

VISHNYAKOV, D. YA

Vishnyakov, D.Ya. "Quenching liquid," reprot (Mosk. in-t stali im. Stalina) 26, 1948, p. 58-75

SO: U-2888, Letopis Zhurnal'nykh Statey, No. 1, 1949

VISHNYAKOV, D. YA.

Vishnyakov, D. Ya. - "The properties of fused salts used in [illegible] furnaces", Sbornik (Mosk. in-t stali im Stalina), 27, 1949, p. 126-76, - Bibliog: 56 items.

SO: U-3042, 11 March 53, (Letopis 'Zhurnal 'nykh Statey, No. 8, 1949).

VISHNYAKOV, D.Ya., professor, doktor.

Effect of the speed of quenching after tempering on the mechanical properties of steel. Sbor.Inst.stali no.31:133-139 '53.(MIRA 9:9)

1.Kafedra metallovedeniya i termicheskoy obrabotki.
(Steel--Testing) (Tempering)

VISHNYAKOV, D. YA.

ANOSOV, Pavel Petrovich, 1797-1851; VOLODINA, N.I., redaktor; BARDIN, I.P., akademik, redaktor; GUDTSOV, N.T., akademik, redaktor; SAMARIN, A.M., redaktor; STARK, B.V., redaktor; PROKOSHKIN, D.A., doktor tekhnicheskikh nauk, redaktor; VISHNYAKOV, D.Ya., doktor tekhnicheskikh nauk, redaktor; DAVIDENKOV, V.A., doktor tekhnicheskikh nauk, redaktor; RASTEGAYEV, M.V., kandidat tekhnicheskikh nauk, redaktor; SOROKIN, Yu.N., kandidat tekhnicheskikh nauk, redaktor; MURZIN, I.I., inzhener, redaktor; ASTAF'YEVA, G.A., tekhnicheskiy redaktor

[Collected works] Sobranie sochinenii. Moskva, Izd-vo Akademii nauk SSSR, 1954. 204 p. (MLRA 7:10)

1. Chlen-korrespondent AN SSSR (for Samarin, Stark)
(Metallurgy)

VISHNYAKOV, Dmitriy Yakovlevich; PAISOV, Ivan Vasil'yevich; LAKHTIN, Yu.M., redaktor; ATTOPOVICH, M.K., tekhnicheskiy redaktor

[Laboratory manual for steel and heat treatment of steel] Posobie k laboratornym zaniatiiam po metallovedeniiu i termicheskoi obrabotke stali. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1955. 113 p. (MLRA 8:7)
(Steel)

AUTHOR: Vishnyakov, D.Ia, Dr. of Technical Sciences, Professor, and Vinitskiy, A.G., Engineer. 129-4-1/17

TITLE: Wear resistance of carbon and high chromium steels. (Isnosostoykost' uglerodistykh i vysokokhromistykh staley.)

PERIODICAL: "Metallovedenie i Obrabotka Metallov" (Metallurgy and Metal Treatment), 1957, No. 4, pp. 2 - 9 (U.S.S.R.)

ABSTRACT: Certain problems of the dependence of the wear resistance of annealed carbon and high chromium steels on their structure were studied. The chemical composition, hardness and the initial structure of the investigated carbon steels are given in Table 1, p.2; the chemical compositions of the investigated chromium steels are given in Table 2, p.3 and their mechanical characteristics are given in Table 4, p.5. The compositions of the Fe-Cr-C alloys were selected in such a way that various quantities of a given type of carbide were obtained for an equal degree of alloying. Dry friction tests as well as friction tests with an abrasive intermediate layer were carried out on an Amsler-type machine, using a method applicable for open hinges of a track chain. The top specimens, 10 x 10 x 16 mm, were made of the investigated material, whilst the rolls were made of a Cr-Si steel (1.30 to 1.60% Cr and 1.00 to 1.30% Si) hardened and tempered to a hardness of R_C = 45 to 48. The diameter of the roll was 36 mm and its

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Wear resistance of carbon and high chromium steels. (Cont.)
129-4-1/17

speed 200 r.p.m. The wear was produced by vertical oscillatory movement of the top specimen with a continuous variation of the specific pressure on the friction surface. In tests with an abrasive intermediate layer the wear intensity was 3 to 9 times as high as the wear in the case of dry sliding friction and depends on the composition and the structure of the steel. Increase of the quantity of the carbides in carbon and high chromium steels brings about an increase in their wear resistance and this applies to the tests with an abrasive intermediate layer and also, in the case of dry friction, for all the structures investigated in the experiments. The influence of the quantity of carbides on the wear resistance of high chromium steels in the case of tests with an abrasive intermediate layer are considerably lower than in the case of dry sliding friction; for an equal quantity of carbide and an equal structure of the steel a higher wear resistance was observed for cubic chromium carbide than for steel containing trigonal carbide. In the case of dry sliding friction rubbing pairs consisting of a high chromium alloy with a Cr-Si steel of the above mentioned composition has a higher wear resistance than carbon steel rubbing pairs. 7 figures, including graphs and micro-photos. 4 tables. 5 references, all of which are Slavic.

ASSOCIATION: Moscow Aviation Technological Institute (Moskovskiy Aviatsionnyy Tekhnologicheskiy Institut)

AUTHORS: Vishnyakov, D. Ya., Doctor of Technical Sciences Prof. and Ol'khovoy, L. S., Candidate of Technical Sciences.

129-9-5/14

TITLE: Pearlitic transformation in chromium steel containing niobium and zirconium. (Perlitnoye prevrashcheniye v khromistoy stali, soderzhashchey niobiy i tsirkoniy).

PERIODICAL: "Metallovedeniye i Obrabotka Metallov" (Metallurgy and Metal Treatment), 1957, No.9, pp.18-21 (U.S.S.R.)

ABSTRACT: The results are described of experiments relating to isothermal transformation of the austenite of chromium steels containing niobium and zirconium. The tests were carried out by preliminary heating to 1000 C and using an Akulov "anisometer" and a microstructural method and also by preliminary heating to 1300 C and using solely a microstructural method. The kinetics of isothermal transformation of the austenite and the microstructure of its decomposition products proved analogous for all the investigated alloys. Therefore, the results are given for only two steels with the following compositions: 0.35% C, 0.3% Mn, 0.28% Si, 2.15% Cr, 0.25% Nb, 0.007% S , 0.030% P and 0.37% C, 0.51% Mn, 0.25% Si, 2.07% Cr, 0.05% Zr, 0.017% S and 0.016% P. On the basis of the results the authors conclude that during isothermal transformation of super-cooled austenite of chromium steel

Card 1/2

Pearlitic transformation in chromium steel containing niobium and zirconium. (Cont.)

129-9-5/14

with niobium and zirconium the form of the separated out pearlite changes in the pearlitic range with increasing super-cooling below the temperature of the upper bend of the S-shaped curve and the evolution of acicular pearlite formations can be observed. In the upper part of the intermediate range the isothermal transformation of austenite into acicular troostite does not proceed fully, a certain fraction of non-transformed austenite remains which, after a certain time, becomes transformed into acicular pearlite. There are 5 figures (graphs and micro-photographs), and two German references.

AVAILABLE:

Card 2/2

Vishnya Kov, D Ya

AUTHORS: Vishnyakov, D. Ya., and Vinitskiy, A. G.

TITLE: Procedure of Laboratory Testing for Abrasion Wear (Metodika laboratornogo ispytaniya splavov na abrazivnyy iznos)

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, No. 1, pp. 78-83 (U.S.S.R.)

ABSTRACT: The article deals with the testing of materials used for making caterpillar treads with a view to improving their wearing properties. The authors have developed an accelerated method of testing to take the place of the old method, which simulated conditions of actual use. The method of the authors tests wearing under friction either with or without abrasive on the friction machine of Amsler's system. The drawings 1, 2 and 3 show the principles of the device used. The graphs 4 and 5 represent the lines of wearing for 7 different materials. These show the dependence of the amount of wear on the total path of friction when experimenting with an abrasive. Figure 6 shows the wear on the top block. Graph 8 shows comparative wear of different kinds of steel. Graph 9 shows comparative wear for articulated joints of caterpillar treads. Graph 10 compares data of laboratory and stand tests. The table compares the wear of rollers and other elements made of different materials. There are 3 Slavic references.

Card 1/2

Procedure of Laboratory Testing for Abrasion Wear

ASSOCIATION: Moscow Aviation Technological Institute (Moskovskiy aviatsionnyy tekhnologicheskiy institut)

PRESENTED BY:

SUBMITTED:

AVAILABLE:

Card 2/2

VISHNYAKOV, D. Ya.

137-58-3-5986

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 3, p 219 (USSR)

AUTHORS: Vishnyakov, D. Ya., Ol'khovoy, L. S.

TITLE: The Effect of Niobium and Zirconium on the Anneal Brittleness of Chromium Steel (Vliyaniye niobiya i tsirkoniya na otpusknuyu khrupkost' khromistoy stali)

PERIODICAL: Sb. Mosk. in-t stali, 1957, Vol 36, pp 131-146

ABSTRACT: An account of an investigation of the effect of Nb(0.25-1.0 percent) and Zr(0.05-0.50 percent) on the anneal brittleness (AB) of Cr steel containing 0.31-0.41 percent C, 0.30-0.51 percent Mn, 0.25-0.42 percent Si, 1.75-2.30 percent Cr, 0.017-0.023 percent S, and 0.013-0.23 percent P. A portion of the steel melts contained 0.37 percent Mo, two melts contained W (0.35 percent and 0.60 percent), and one melt contained 0.18 percent V. Susceptibility to AB was evaluated from the difference in critical temperatures of brittleness (T_{br}) before and after annealing. After tempering (T) starting at temperatures equivalent to Ac_3+(30-50°), Ac_3+100°, and Ac_3+300°, the specimens were annealed at 620-680°C and were then rendered brittle by heating

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The Effect of Niobium and Zirconium (cont.)

to 500° for a period of 12 hours, followed by cooling in the furnace. Impact tests were conducted at temperatures ranging from -78° to +400°. The highest experimental temperature at which traces of brittle failure began to appear in the fractured region was taken as the T_{br}. It was established, by means of carbide analysis, that Nb begins to change into a solid solution only at T temperatures of 1200° and above. The Nb present in the solid solution reduces the susceptibility of Cr steel to AB and lowers the T_{br}, while the Nb present in the steel in the form of carbides does not appreciably influence the susceptibility of Cr steels to AB and raises the T_{br} considerably. Introducing 0.6 percent W into the steel considerably reduces its susceptibility to AB and lowers the T_{br} at tempering temperatures starting at 1000°; after T at temperatures starting at 1200°, however, the effect of W is considerably less. Adding Mo to steel containing Nb does not eliminate the tendency of steel to AB. Simultaneous presence of Nb, Mo, V, and Cr in the solid solution increases the tendency toward AB. V greatly increases the susceptibility to AB in Cr-Nb-Mo steel. Zr affects the AB in a manner analogous to the effect of Nb. Introduction of Mo into a Cr-Zr steel very substantially reduces the tendency for AB and simultaneously lowers the T_{br}. Steels with greater tendency for AB are characterized by greater susceptibility to etching of grain boundaries. The AB is not as much determined by the total amount of elements present in the steel as by the content of these elements in a layer

The Effect of Niobium and Zirconium (cont.)

disposed on the grain boundaries where the processes responsible for the AB occur.

M. Sh.

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VISHNYAKOV, D. YA.
(Moscow)

PHASE I BOOK EXPLOITATION 841

Moscow. Aviatsionnyy tekhnologicheskiy institut

Metallovedeniye i tekhnologiya termicheskoy obrabotki (Physical Metallurgy and Technology of Heat Treatment) Moscow, Oborongiz, 1958. 179 p. (Series: Its: Trudy, vyp. 31) 3,200 copies printed.

Ed. (title page): Vishnyakov, D.Ya., Doctor of Technical Sciences, Professor; Ed. (inside book): Kunyavskaya, T.M.; Tech. Ed.: Rozhin, V.P.; Managing Ed.: Zaymovskaya, A.S., Engineer.

PURPOSE: This book is intended for production engineers, physical metallurgists, heat-treatment specialists, and other scientific and technical personnel, as well as for advanced students.

COVERAGE: The book is devoted to the study of properties of heat-resistant alloys, the effect of steel structure on wear resistance, phase transformations and recrystallization in alloys, and also the effect of the conditions under which alloys are heat-treated on the structure and properties of the alloys. For references and additional coverage, see Table of Contents.

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TABLE OF CONTENTS:

Author's conclusions: 1. Carbon steels with a laminated pearlitic structure are more wear-resistant than steels with a granular pearlitic structure. 2. An increase in the amount of laminar pearlite results in a drop in the rate of wear, especially in hypoeutectoid steels. There are 4 references, all Soviet.

Vishnyakov, D.Ya.; Vinitskiy, A.G. Effect of Structure on the Wear Resistance of Iron-Chromium-Carbon Alloys 50

Author's conclusions (in part): 1. An increase in the quantity of special carbides in annealed and hardened chrome steels increases their wear resistance. 2. A given quantity of cubic crystals of chromium carbide imparts greater wear resistance than the same quantity of trigonal carbides, other conditions being equal. 3. The relationship between wear resistance, hardness, and certain other mechanical properties of annealed chrome steels can be observed only within the limits of identical structures. There are 3 references, all Soviet.

The author discusses the special problems connected with the heat treatment, especially hardening, of elongated aluminum-alloy semi-finished products (shapes, pipes, sheet, etc.), particularly such problems as maintaining constant temperature and the achievement of rapid and uniform heating. There are 5 references, of which 4 are Soviet and 1 is German.

Livanov, V.A.; Yelagin, V.I., Candidate of Technical Sciences. Investigation of AMg6 Heat-resistant Alloy with Additions of Iron and Nickel 138

The author's investigation shows that small additions of iron (0.08-0.92%) and nickel (0.17-0.72%) do not improve the mechanical properties of AMg6 alloy (Al + 6% Mg) at elevated temperatures. There are 7 references, of which 5 are Soviet, 1 is English, and 1 German.

Livanov, V.A.; Yelagin, V.I. The Extrusion Effect at Elevated Temperatures 143

An investigation of the "extrusion effect" (increased strength as a result of the extrusion process) in alumimum-magnesium alloys with additions of chromium and manganese (together and separately) shows

AVAILABLE: Library of Congress

Card 8/8

GO/mas
11-28-58

AUTHORS: Vishnyakov, D.Ya., Sovalova, A.A. SOV/163-58-1-51/53

TITLE: The Cementation of Stainless Steels (Tsementatsiya nerzhaveyushchikh staley)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 1, pp 269 - 274 (USSR)

ABSTRACT: The cementation of the stainless steels 2X13 and X17H2 as well as their mechanical properties were investigated. The cementation was carried out in a solid and a gas carbonizer. It was found that the cementation of stainless steels with solid carburizer does not yield any positive result. The gas cementation was carried out in the shaft furnace at 950° over a period of 7, 14 and 21 hours. The samples were investigated with respect to their hardness after cementation. The hardness after a cementation for 7 hours in the case of the steel X17H2 reaches a value of 61 - 64 R_c. By further prolonging the duration of the cementation the hardness increases up to 66 - 68 R_c.

The steel sample 2X13 after a cementation for 7 hours reaches a value of 58 - 59 R_c. By prolonging the duration of cementation the hardness of the steel sample decreases to 34 - 36 R_c.

Card 1/2

The Cementation of Stainless Steels SOV/163-58-1-51/53

Metallographic investigations of the cemented samples showed that these samples have the same diffusion and a lower content of carbon.
To determine the optimum production temperature for the hardest samples the cemented samples were hardened at temperatures of 1000° and 1050°. The greatest hardness of the steel sample X17H2 was obtained at temperatures of 1000 - 1150 (60 R_c).

The cemented samples were also mechanically investigated. By hardening at 1000° C and tempering at 160° C all samples obtained a uniform hardness of 62 - 65 R_c.

The optimum conditions for hardening are obtained with oil hardening at 1000° C.
By raising the hardening temperature the plastic properties of the samples were decreased. There are 2 figures, 5 tables, and 2 references, 2 of which are Soviet.

Card 2/2

ASSOCIATION: Moskovskiy aviatsionnyy tekhnologicheskiy institut (Moscow Aviation Institute of Technology)

SUBMITTED: October 15, 1957

VISHNYAKOV, D.YA.

AUTHORS: Vishnyakov, D.Ya., Neustruyev, A.A. 32-1-27/55

TITLE: The Determination of the Cooling Property of Molten Salts (Opredeleniya okhlazhdayushchey sposobnosti rasplavlennykh soley).

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 1, pp. 63-65 (USSR)

ABSTRACT: It is said in the introduction that, although molten salts have been used for thermal treatment of steels in the USSR already for 15 to 20 years, nothing as yet has been published in this respect in Soviet scientific literature. The cooling properties of liquids in general are defined in the USSR in different manners [Ref.14]. In the present paper this property is judged according to the value of the heat transfer coefficient α from the surface of the body to the liquid; on this basis the corresponding theories are developed. For the experiments the sodium nitrate and sodium nitrite as well as the mixture of 45% $NaNO_3$ and 55% KNO_3 was used. The process of hardening was carried out on a sample of steel "35", which was heated up to a temperature of 1100°. At normal conditions α is determined according to the following formula:

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$\alpha = \frac{cG}{\psi F T} \ln \frac{t_{init.} - t_{med.}}{t_{end} - t_{med.}}$ Here c denotes the heat capacity (in kcal/kg.°C) of the sample; G and F - the weight (in kg) and the surface (in m^2) of the sample; $t_{init.}$, t_{end} - temperatures respectively of the samples; $t_{med.}$ - temperature of the cooling medium; ψ - coefficient of temperature drop in the cross section of the sample, and T - the time between $t_{init.}$ to t_{end}. In this connection it is explained that the experimentally obtained value of α is 1700 kcal/m^2h°C and can be verified in the course of thermal treatment, and that therefore the -values of 500 kcal/m^2h°C mentioned in publications [Ref.6] must be wrong. This value of α, however, decreases considerably towards the end of the process and with a temperature difference of less than 50° an average value of 600 - 800 kcal/m^2h° is obtained, and the salt medium is heated up to 150 - 250°. There are 2 figures and 6 Slavic references.

ASSOCIATION: Moscow Aviation-Technological Institute and Moscow Steel Institute (Moskovskiy aviatsionnyy tekhnologicheskiy institut i Moskovskiy institut stali).

AVAILABLE: Library of Congress

Card 2/2 1. Metallurgy 2. Steels-Hardening

Vishnyakov, D. Ya

PHASE I BOOK EXPLOITATION SOV/4782

Moscow. Institut stali

Proizvodstvo i obrabotka stali i splavov (Production and Treatment of Steel and Alloys). Moscow, Metallurgizdat, 1960. 462 p. (Series: Its: Sbornik, 39) 2,100 copies printed.

Ed.: Ye. A. Borko; Ed. of Publishing House: S. L. Zinger; Tech. Ed.: M. R. Kleynman; Editorial Council of the Institute: M. A. Glinkov, Professor, Doctor of Technical Sciences; R. N. Grigorash, Docent, Candidate of Technical Sciences; V. P. Yelyutin, Professor, Doctor of Technical Sciences; A. A. Zhukhovitskiy, Professor, Doctor of Chemical Sciences; I. N. Kidin, Professor, Doctor of Technical Sciences; B. G. Livshits, Professor, Doctor of Technical Sciences; A. P. Lyubimov, Professor, Doctor of Technical Sciences; I. M. Pavlov, Corresponding Member, Academy of Sciences USSR; and A. N. Pokhvisnev, Professor, Doctor of Technical Sciences.

PURPOSE: This book is intended for technical personnel in industry, scientific institutions and schools of higher education, dealing with open-hearth and electric-furnace steelmaking, metal rolling, physical metallurgy, metallography, and heat-treatment. It may

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also be used by students specializing in these fields.

COVERAGE: The book contains results of theoretical and experimental investigations of metallurgical and heat-engineering processes in open-hearth and electric furnaces. Data are included on the following: desulfurizing of pig iron outside the blast furnace, interaction of oxides of the carbide-forming metals with solid carbon, the change of content of gases in the bath of the open-hearth furnace in various periods of melting, intensification of the electric melting of steel, etc. Other articles deal with the nonuniformity of deformation in rolling, the study of the continuous rolling process, the dependence of the friction-slippage coefficients in rolling on a number of factors, and other problems in the pressworking of metals. Articles on physical metallurgy and the theoretical principles and techniques of the heat treatment of steel are also included. No personalities are mentioned. References accompany most of the articles. There are 207 references, both Soviet and non-Soviet.

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S/148/60/000/011/010/015
A161/A030

AUTHORS: Vishnyakov, D. Ya., Lei T[illegible]

TITLE: The effect of molybdenum and additional alloying on the stability of austenite and the hardenability of manganese machinery steel

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no. 11, 1960, 97 - 101

TEXT: It is generally believed that elements forming resistant carbides cannot be used for raising the austenite stability and hardenability of steel, and it had been pointed out in the works that Ti, V, Nb, Zr, Ta and partly W, which form stable carbides at the usual quenching temperatures (800 - 900°C), are insoluble in austenite and decrease hardenability instead of increasing it. But it had been found in one work (Ref 7: L. I. Kogan, R. I. Entin, Problemy metallovedeniya i fiziki metallov. Metallurgizdat, 1955, No. 3) that the partial introduction of Ti, V, Nb, and Zr carbides into austenite [illegible] 900 - 1000°C and alloyed with manganese (1.5 - 2% Mn) [illegible] the Cr effect [illegible]

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S/[illegible]/60/000/0[illegible]/010/015
A[illegible]/A030

The effect of molybdenum and [illegible]

weaker), and that the [illegible] in the intermediate [illegible] At the Moscow Steel Institute [illegible] austenite and hardenability [illegible] The experimental steel [illegible] with about 0.5% Mo and [illegible] 0.2 to 0.5 %. Steel was [illegible] and cast into 37 kg ingots that [illegible] 1250 - 950°C into 15 and [illegible] 850°. The kinetics of the [illegible] Akulov anisometer and by [illegible] lity was determined by butt and [illegible] used for carbide analysis (by [illegible] Obshchiy, 1957, 49 - 52). Specimens [illegible] were quenched in water from [illegible] then ground to 10 mm diameter [illegible] per 1 liter water was used [illegible] 0.01 amp/cm² current. The [illegible]

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had one austenite stability minimum (520°) in the initial transformation, and two less pronounced minima in the final stages (75 and 95°). Addition of 0.29 % Mo to this steel raised the austenite stability very much in the pearlite range (above 550°) and reduced it in the intermediate range. Addition of a third element had no effect on the diagram. The highest austenite stability observed with about 0.2% Zr corresponded to the highest hardenability; the effect of 0.2% Ti was slightly weaker; with 0.5 % Zr or 0.5 % Ti the stability and hardenability of austenite were lower; Nb had nearly no effect in intermediate region. The carbide analysis revealed that in annealed state carbides contained nearly 1/4 of the total Mn content in steel, 1/3 - 1/4 of total Mo, and nearly all Ti and Nb. Quenching from A_{c_3} + 50° led to the transfer of nearly all Mn and a slight quantity of Mo into the solid solution. Conclusions: 1) Machinery steel with 0.4 % C and 1.8 % Mn has no clear intermediate austenite stability stage, and its C-diagram is simple. 2) Mo raises the austenite stability a lot in the pearlite range and has little effect in the intermediate stage. The C-diagram of Mn-Mo steel has clear minimum stability points in the pearlite stage (610°) and in the intermediate stage (430°). Its hardenability is determined mainly by the austenite stability in the intermediate range and is

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therefore insufficiently high. 3) Difficult-soluble Ti, Nb and Zr carbides (TiC type) are partly solved in the austenite of Mn-Mo steel at normal quenching temperatures (A_{c_3} + 50°); further rise in the quenching temperature (to 1200°) does not increase the Ti and Nb content in the solid solution. 4) The effect of Ti, Nb and Zr on the austenite stability in the steel studied depends on the content. At a relatively low content (about 0.2 %) they raise the austenite stability in the pearlite and the intermediate region, but at higher contents (about 0.5%) they have a negative effect. The lowest effect on the austenite stability has Nb in the studied quantity (0.2 - 0.5 %). 5) The effect of Ti, Nb and Zr on the hardenability of Mn-Mo steel corresponds with the effect of these elements on the kinetics of isothermic austenite transformation. There are 5 figures and 8 Soviet references.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: March 11, 1960

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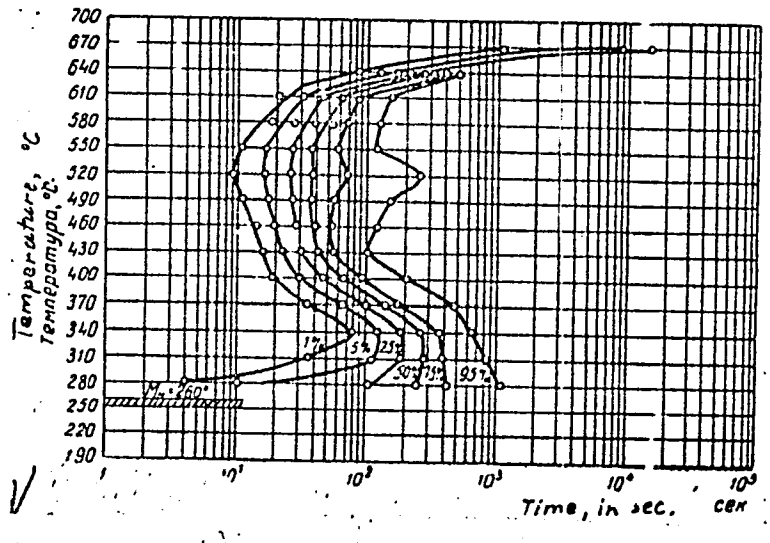
Figure 1:



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VISHNYAKOV, D.Ya., prof., doktor tekhn.nauk; SOVALOGA, A.A., kand.tekhn. nauk; STROGANOV, G.B., inzh.

Isothermal treatment of tool steels. Trudy MATI no.43:5-11 '60. (MIRA 13:7)

(Tool steel--Heat treatment)

23010
S/536/60/000/043/001/011
E193/E483

1:7100 also 1416, 1454

AUTHORS: Vishnyakov, D.Ya., Doctor of Technical Sciences, Professor and Sovalova, A.A., Candidate of Technical Sciences

TITLE: Properties of Carburized Stainless Steels

PERIODICAL: Moscow. Aviatsionnyy tekhnologicheskiy institut. Trudy. No.43. 1960. pp.12-24. Termicheskaya obrabotka i svoystva stali i legkikh splavov

TEXT: The object of the present investigation was to establish the optimum conditions for carburizing stainless steels of the ferritic type and to determine various properties of both the core and the hardened surface layer of carburized components. The compositions (in %) of the steels, used in the experiments, are as follows:

Table 1

Designation of steel	C	Cr	Ni	Mn	S	P
1X13 (1Kh13)	0.12	12.84	0.22	0.45	0.014	0.028
2X13 (2Kh13)	0.19	13.80	-	-	-	-
X17N2 (Kh17N2)	0.13	16.80	2.23	0.57	0.010	0.024

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Immediately before the carburizing treatment, the test pieces were sand-blasted in order to remove the surface oxide layer. The treatment itself was carried out in a shaft furnace, products of pyrolysis of pyrobenzol being used as the carburizing medium. In the first series of experiments, the effect of the duration (7 to 28 h) of carburizing at 950°C on the thickness and hardness of the carburized layer was studied. (The test pieces were air-cooled after the carburizing treatment and no other heat treatment was applied.) It was found that the thickness of the carburized layer on steel 2Kh13 increased almost linearly with time being 0.75 mm after 14 h and 1.23 mm after 28 h. In the case of steel Kh17N2, the depth of carburizing reached 0.95 mm after 14 h and increased very slowly on further treatment. Hardness (R_C) of the carburized layer formed after 14 h on steel 2Kh13 was 57 - 58, the corresponding figure for steel Kh17N2 being 62 - 65. On further treatment, hardness decreased to 34 - 36 in the former case and increased to 66 - 68 in the latter case. The results of the next series of experiments showed that hardness of the carburized layer can be increased to $R_C > 60$ by quenching the specimens from 1000°C (steel 2Kh13) or 950°C (steel Kh17N2). After a heat

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treatment consisting of quenching from 1000 - 1100°C, cooling to -60°C and tempering at 160°C, carburized specimens of all the steels studied had hardness $R_C > 61$. The object of the next series of experiments was to establish how the mechanical properties of the core are affected by both the carburizing process and the subsequent heat treatment. To this end, specimens of the steels studied were held at 950°C for 14 to 15 h without the application of the carburizing medium. After cooling in air, the specimens were annealed at 650°C and used for the preparation of test pieces which were then subjected to the heat treatment identical to that applied earlier to the carburized specimens. The results of mechanical tests carried out on these test pieces are given in Table 4. The symbols used in this table denote the following: σ_b - U.T.S.; $\sigma_{0.2}$ - 0.2% proof stress; δ - elongation; ψ - reduction in area; a_H - impact strength; R_C - Rockwell hardness (scale C). The transverse bending strength of carburized test pieces, subjected to various heat treatments, was determined next. It was found that increasing the quenching temperature from 1000 to 1050°C brought about a

decrease in the transverse bending strength σ_i and deflection f of carburized steel 1Kh13; in the case of steels 2Kh13 and Kh17N2, only σ_i was affected in this manner. The results of the next series of experiments are reproduced in Fig.7, where the impact strength (a_H, kgm/cm^2) of steel 1Kh13 (left-hand diagram) and steel Kh17N2 (right-hand diagram) is plotted against the quenching temperature, curves 1 and 2 relating, respectively, to notched non-carburized and unnotched carburized test pieces. It will be seen that the impact strength of steels studied decreases sharply after carburizing and that it depends (to some extent) on the properties of the core material. In the next stage of the investigation, the wear-resistance of carburized and heat-treated steels was studied with the aid of a Skoda-Savin testing machine. Cemented carbide grinding wheels were used in these tests which were conducted "wet", with a jet of K_2CrO_4 solution impinging on the ground portion of the specimen. The results are reproduced in Fig.8, which shows the volume (10^{-3} mm^3) of the metal removed after 500 revs of the grinding wheel from (a) nitrided steel 38XMIOA (38KhMYuA); (b) carburized, nitrided and hardened and tempered

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steel 2Kh13; (c) carburized, nitrided and hardened and tempered steel Kh17N2. The effect of various heat treatments on the wear-resistance of carburized test pieces is shown in Fig.9, where the volume (10^{-3} mm^3) of metal removed after 1000 revs is plotted against the quenching temperature (°C) for steel Kh17N2 - quenched, subjected to sub-zero treatment and tempered (curve 1), steel Kh17N2 - quenched and tempered only (curve 2) and steel 2Kh13 - quenched and tempered (curve 3). Finally, corrosion tests were carried out on carburized, fully heat-treated, and polished specimens, immersed for 2 months in kerosene or in tap water, or for 1 month in artificial sea water. Only in the latter case was the evidence of corrosion, confined to a few isolated spots, observed. The following conclusions were reached:
(1) Stainless steels of the ferritic type can be gas-carburized to a depth of 0.7 to 0.8 mm by 14 to 15 h treatment at 950°C.
(2) The best combination of mechanical properties can be imparted to carburized components by the following treatment: oil-quenching from 1000°C; subzero treatment at -60°C; tempering at 160°C. The hardness of the carburized layer after this treatment is

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62 to 65 R_C (for all steels studied). The properties of the core are given in Table 7. The properties of carburized specimens after the optimum treatment are given in Table 8.
(3) The wear-resistance of carburized stainless steels is comparable to that of nitrided steel 38KhMYuA. Their corrosion resistance in kerosene and tap water is excellent; in sea water it is comparable to that of steel Ж18 (Kh18).
G.A.Slepoy and N.A.Bystrova participated in the experiments.
There are 9 figures and 8 tables.

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